LAWRENCE
LIVERMORE
NATIONAL
LABORATORY

LLNL-TR-659192

Distribution System Simulation Results

Y. Qin

August 26, 2014

Disclaimer

This work performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

Description of Model and Results Files

The associated data sets are results of simulations of randomly-generated distribution feeder lines in residential areas. The lines are connected to a hypothetical transmission system that maintains constant voltage. The system was built with GRIDLAB-D, an open source suite of distribution system simulation software modules[1].

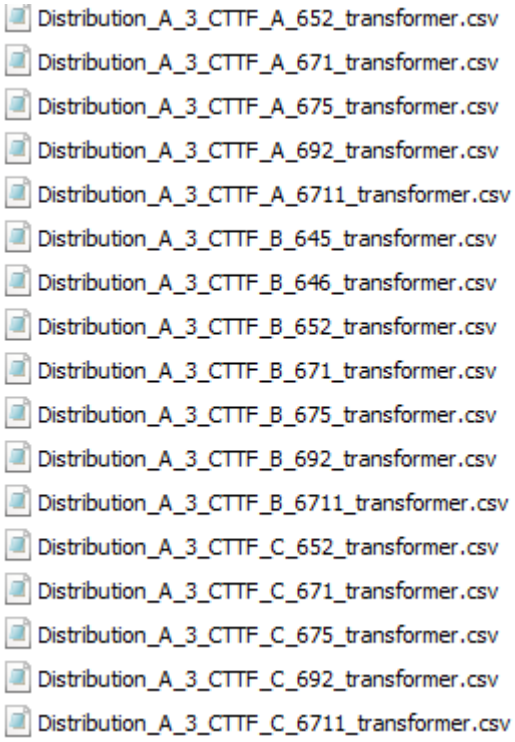
Simulation results are provided as a set of comma-separated-value (csv) files. Content and filenames are listed below.

1. Each simulated day's results are in an individual folder named with the date ranging from Jan-01 to Dec-31.
2. The system has a 6 node 138 KV sub transmission system with fourteen IEEE13 distribution systems. The fourteen distribution systems have a total of 2050 residential houses.
3. Houses are generated randomly with sizes ranging from 1400 to 2900 square feet.
4. Lighting, heating, cooling, plug loads, and water heaters are simulated in this model.
5. The Sacramento climate is file is used for this case
6. The file named "Transmission_A_1_T_D_2_transformer.csv" is the total load of this system.
7. Files with names "Distribution_A_1_substation_transformer.csv" ,…, "Distribution_A_14_substation_transformer.csv" are the loads of the fourteen IEEE13 distribution systems.
8. Files with names "Distribution_A_1_CTTF_A_652_A_transformer.csv", …, "Distribution_A_1_CTTF_A_6711_transformer.csv" are sub transformers under "Distribution_A_1_substation_transformer.csv". Other files follow the same naming convention.

For example, the file structure for distribution system number 3 is shown below.

[1] GRIDLAB-D was developed by Pacific Northwest National Laboratory http://www.gridlabd.org/

Distribution_A_3_substation_transformer.csv



Some sample records from one the files are shown below.

file..... Distribution_A_1_CTTF_A_652_A_transformer.csv
date..... Fri May 09 11:18:34 2014
user..... qin3
host..... (null)
target.... transformer 121
trigger... (none)
interval.. 60
limit..... 0

# timestamp	power_in	power_in_A	power_in_B	power_in_C
2013-01-01 00:00:00 PST	+45675+0.814142d	+45675+0.814142d	+0+0j	+0+0j
2013-01-01 00:01:00 PST	+44999.7+0.816065d	+44999.7+0.816065d	+0+0j	+0+0j
2013-01-01 00:02:00 PST	+44635.2+0.812429d	+44635.2+0.812429d	+0+0j	+0+0j
2013-01-01 00:03:00 PST	+84069.2+7.27243d	+84069.2+7.27243d	+0+0j	+0+0j
2013-01-01 00:04:00 PST	+83487+7.27914d	+83487+7.27914d	+0+0j	+0+0j
2013-01-01 00:05:00 PST	+88202.8+7.93565d	+88202.8+7.93565d	+0+0j	+0+0j
2013-01-01 00:06:00 PST	+63864.3+5.62444d	+63864.3+5.62444d	+0+0j	+0+0j
2013-01-01 00:07:00 PST	+77735.6+7.34656d	+77735.6+7.34656d	+0+0j	+0+0j
2013-01-01 00:08:00 PST	+75869.5+7.21552d	+75869.5+7.21552d	+0+0j	+0+0j
2013-01-01 00:09:00 PST	+69023.6+6.64866d	+69023.6+6.64866d	+0+0j	+0+0j
2013-01-01 00:10:00 PST	+47400.6+3.28397d	+47400.6+3.28397d	+0+0j	+0+0j
2013-01-01 00:11:00 PST	+53642.1+4.64387d	+53642.1+4.64387d	+0+0j	+0+0j
2013-01-01 00:12:00 PST	+77358.3+7.65354d	+77358.3+7.65354d	+0+0j	+0+0j
2013-01-01 00:13:00 PST	+76842.3+7.66042d	+76842.3+7.66042d	+0+0j	+0+0j
2013-01-01 00:14:00 PST	+64949.2+6.51816d	+64949.2+6.51816d	+0+0j	+0+0j
2013-01-01 00:15:00 PST	+47059.5+3.62475d	+47059.5+3.62475d	+0+0j	+0+0j
2013-01-01 00:16:00 PST	+39249.7+1.786d	+39249.7+1.786d	+0+0j	+0+0j
2013-01-01 00:17:00 PST	+53771.9+5.22341d	+53771.9+5.22341d	+0+0j	+0+0j
2013-01-01 00:18:00 PST	+61963.6+6.40901d	+61963.6+6.40901d	+0+0j	+0+0j